AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A membrane electrode assembly comprising two electrochemically active electrodes separated by a polymer electrolyte membrane wherein the polymer electrolyte membrane comprises a polyazole, characterized in that there is a polyimide layer on each of the two surfaces of the polymer electrolyte membrane that are in contact with the electrodes and wherein said polyimide layers on the polymer electrolyte membrane each form a frame structure and
wherein the thickness of the polyimide layer is in the range from 5 μm to 1000 μm,
at least one of the polyimide layers is coated with fluoropolymer and the layer of fluoropolymer has a thickness of at least 0.5 μm,
the contact area between polyimide layer and electrode is at least 5 mm^2,
the two polyimide layers extend beyond the membrane and are in flat contact with one another and the two polyimide layers are welded to one another and
the membrane is obtained by a method comprising the steps of

A. mixing one or more aromatic tetraamino compounds with one or more aromatic carboxylic acids and/or esters thereof containing at least two acid groups per carboxylic acid monomer, or mixing one or more aromatic and/or heteroaromatic diaminocarboxylic acids in polyphosphoric acid to form a solution and/or dispersion,

A' optionally heating the mixture according to step A) under inert gas to temperatures of up to 350°C to form the polyazole polymer,

B. applying a layer using the mixture according to step A) to a support or to an electrode,

C. optionally heating the sheetlike structure/layer obtainable according to step B) under inert gas to temperatures of up to 350°C to form the polyazole polymer,

D. treating the membrane formed in step B) or in step C) until it is self-supporting.

2. (Cancelled)

3. (Cancelled)

4. (Previously presented) The membrane electrode assembly of claim 1, characterized in that the two electrodes have an electrochemically active area whose size is at least 2 cm^2.

5. (Cancelled)

6. (Cancelled).

7. (Currently Amended) The membrane electrode assembly of ~~claim 5, characterized in that~~ claim 1, wherein the fluoropolymer is FEP.

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Currently Amended) The membrane electrode assembly of ~~claim 10, characterized in that~~ claim 1, wherein the membrane electrode assembly has a concentration of phosphoric acid ~~is at~~ of at least 50% by weight.

12. (Cancelled).

13. (Cancelled)

14. (Previously presented) The membrane electrode assembly of claim 1, characterized in that at least one of the electrodes is made of a compressible material.

15. (Previously presented) The membrane electrode assembly of claim 1, characterized in that at least one of the polyimide layers is in contact with at least one of the electrodes.

16. (Original) The membrane electrode assembly of claim 15, characterized in that the surfaces of the polymer electrolyte membrane are completely covered by the two electrodes and the polyimide layers.

17. (Cancelled).

18. (Currently Amended) The membrane electrode assembly of ~~claim 17, characterized in that~~ claim 1, wherein the contact area is less than or equal to 100%, based on the electrochemically active area.

19. (Previously presented) The membrane electrode assembly of claim 15, characterized in that the contact area of the electrode is provided with fluoropolymer.

20. (Cancelled)

21. (Cancelled)

22. (Previously presented) The membrane electrode assembly of claim 1, characterized in that the two polyimide layers are in contact with electrically conducting separator plates.

23. (Previously presented) The membrane electrode assembly of claim 1, characterized in that the surfaces of the polymer electrolyte membrane are covered completely by the two electrodes and the polyimide layers.

24. (Previously presented) A fuel cell comprising at least one membrane electrode assembly according to claim 1.

25. (Currently Amended) The membrane electrode assembly of ~~claim 13~~ claim 1, wherein the heating in said step C) is required and at temperatures of up to 280°C.

26. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein the thickness of the polyimide layer is in the range from 5 μm to 1000 μm.

27. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein the two electrodes have an electrochemically active area whose size is at least 2 cm^2.

28. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein that the polymer electrolyte membrane comprises polyazoles.

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Cancelled) The membrane electrode assembly of claim 30, wherein the degree of doping is between 3 and 50 weight %.

34. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein at least one of the electrodes is made of a compressible material.

35. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein at least one of the polyimide layers is in contact with at least one of the electrodes.

36. (Previously presented) The membrane electrode assembly of claim 35, wherein the surfaces of the polymer electrolyte membrane are completely covered by the two electrodes and the polyimide layers.

37. (Cancelled)

38. (Cancelled)

39. (Cancelled)

40. (Cancelled)

41. (Cancelled)

42. (Cancelled)

43. (Cancelled)

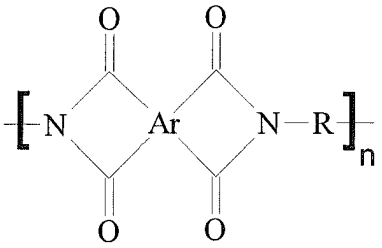
44. (Currently Amended) A fuel cell comprising at least one membrane electrode assembly according to ~~claim 5~~ claim 16.

45. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein the frame overlaps with the electrode.

46. (Previously presented) The membrane electrode assembly of claim 45, wherein the overlap is from 0.2 to 5 mm.

47. (Currently Amended) The membrane electrode assembly of ~~claim 5~~ claim 1, wherein the frame does not cover the free electrode area.

48. (Previously presented) The membrane electrode assembly of claim 1, wherein the polyimide contains repeating units of the formula (VI)



(VI)

wherein

the radical Ar is identical or different at each occurrence and is a tetravalent aromatic or heteroaromatic group which may be monocyclic or polycyclic,

the radical R is an alkyl group or a divalent aromatic or heteroaromatic group having 1 to 40 carbon atoms and

n indicates that the repeating units constitute part of the polymers.

49. (New) The membrane as claimed in claim 1, wherein step A' is required.

50. (New) The membrane electrode assembly of claim 49, wherein the heating in said step in A' is at temperatures of up to 280°C.

51. (New) A membrane electrode assembly comprising two electrochemically active electrodes separated by a polymer electrolyte membrane wherein the polymer electrolyte membrane comprises a polyazole, characterized in that there is a polyimide layer on each of the two surfaces of the polymer electrolyte membrane that are in contact with the electrodes and wherein said polyimide layers on the polymer electrolyte membrane each form a frame structure and

wherein the thickness of the polyimide layer is in the range from 5 μm to 1000 μm,
at least one of the polyimide layers is coated with fluoropolymer and the layer of fluoropolymer has a thickness of at least 0.5 μm,
the contact area between polyimide layer and electrode is at least 5 mm^2,
the two polyimide layers extend beyond the membrane and are in flat contact with one another and the two polyimide layers are welded to one another and
the membrane is obtained by a method comprising the steps of

I) dissolving the polyazole polymer in polyphosphoric acid,
II) heating the solution obtainable in accordance with step I) under inert gas to temperatures of up to 400°C,
III) forming a membrane using the solution of the polyazole polymer according to step II) on a support, and
IV) treating the membrane formed in step III) until it is self-supporting.

52. (New) A membrane electrode assembly comprising two electrochemically active electrodes separated by a polymer electrolyte membrane wherein the polymer electrolyte membrane comprises a polyazole, characterized in that there is a polyimide layer on each of the two surfaces of the polymer electrolyte membrane that are in contact with the electrodes and wherein said polyimide layers on the polymer electrolyte membrane each form a frame structure and

wherein the thickness of the polyimide layer is in the range from 5 μm to 1000 μm,
at least one of the polyimide layers is coated with fluoropolymer and the layer of fluoropolymer has a thickness of at least 0.5 μm,

the contact area between polyimide layer and electrode is at least 5 mm^2,
the two polyimide layers extend beyond the membrane and are in flat contact with one another and the two polyimide layers are welded to one another and
the membrane is obtained by a method comprising the steps of

A) mixing one or more aromatic tetraamino compounds with one or more aromatic carboxylic acids and/or esters thereof containing at least two acid groups per carboxylic acid monomer, or mixing one or more aromatic and/or heteroaromatic diaminocarboxylic acids in polyphosphoric acid to form a solution and/or dispersion,
B) applying a layer using the mixture according to step A) to a support or to an electrode,
C) heating the sheetlike structure/layer obtainable according to step B) under inert gas to temperatures of up to 350°C to form the polyazole polymer,
D) treating the membrane formed in step C) (until it is self-supporting).

53. (New) A membrane electrode assembly comprising two electrochemically active electrodes separated by a polymer electrolyte membrane wherein the polymer electrolyte membrane comprises a polyazole, characterized in that there is a polyimide layer on each of the two surfaces of the polymer electrolyte membrane that are in contact with the electrodes and wherein said polyimide layers on the polymer electrolyte membrane each form a frame structure and
wherein the thickness of the polyimide layer is in the range from 5 μm to 1000 μm,
at least one of the polyimide layers is coated with fluoropolymer and the layer of fluoropolymer has a thickness of at least 0.5 μm,
the contact area between polyimide layer and electrode is at least 5 mm^2,
the two polyimide layers extend beyond the membrane and are in flat contact with one another and the two polyimide layers are welded to one another and
the membrane is obtained by a method comprising the steps of

1) reacting one or more aromatic tetraamino compounds with one or more aromatic carboxylic acids and/or esters thereof containing at least two acid groups per carboxylic acid monomer, or one or more aromatic and/or heteroaromatic diaminocarboxylic acids in the melt at temperatures of up to 350°C,
2) dissolving the solid prepolymer obtained according to step 1) in polyphosphoric acid,
3) heating the solution obtainable according to step 2) under inert gas to temperatures of up to 300°C to form the dissolved polyazole polymer,

4) forming a membrane using the solution of the polyazole polymer according to step 3) on a support, and

5) treating the membrane formed in step 4) until it is self-supporting.

54. (New) The membrane as claimed in claim 1, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

55. (New) The membrane as claimed in claim 25, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

56. (New) The membrane as claimed in claim 49, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

57. (New) The membrane as claimed in claim 51, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

58. (New) The membrane as claimed in claim 52, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

59. (New) The membrane as claimed in claim 53, wherein the concentration of moles of phosphoric acid per repeating unit is between 10 to 50.

60. (New) The membrane as claimed in claim 25, wherein the concentration of moles of phosphoric acid per repeating unit is between 12 to 40.

61. (New) The membrane as claimed in claim 49, wherein the concentration of moles of phosphoric acid per repeating unit is between 12 to 40.

62. (New) The membrane as claimed in claim 51, wherein the concentration of moles of phosphoric acid per repeating unit is between 12 to 40.

63. (New) The membrane as claimed in claim 52, wherein the concentration of moles of phosphoric acid per repeating unit is between 12 to 40.

64. (New) The membrane as claimed in claim 53, wherein the concentration of moles of phosphoric acid per repeating unit is between 12 to 40.

65. (New) The membrane as claimed in claim 1, wherein step D) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

66. (New) The membrane as claimed in claim 25, wherein step D) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

67. (New) The membrane as claimed in claim 49, wherein step D) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

68. (New) The membrane as claimed in claim 51, wherein step IV) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

69. (New) The membrane as claimed in claim 52, wherein step D) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

70. (New) The membrane as claimed in claim 53, wherein step 5) takes place at temperatures above 0°C and less than 150°C, in the presence of moisture, water, water vapor,water-containing phosphoric acid of up to 85% or a mixture thereof.

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